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(54) Telecommunications system

(57) The telecommunications system has switching means (6, 24) for enabling a telecommunications device such as a telephone (8) to establish a telecommunications link with another device, for example a telephone (22) in response to dialling information from the first of said devices. The system also has storage means (18) for storing pre-recorded message data such as advertisements, and delay means (14) which modifies the operation of the switching means so as to delay the completion of the link between the telecommunications devices (8; 22). During that time, message transmission means (14) transmits an advertising message to the first said device (8). The system may also include bypass means (14) to enable the transmission of the message and the associated delay optionally to be avoided. An incentive to receive the message can be provided by offering a reduced charge or a free telecommunications link if the caller elects to accept the message. This feature of being able to vary or waive the charge of a link depending upon whether an advertisement is accepted, can be present in a system which does not include the aforementioned delay means.

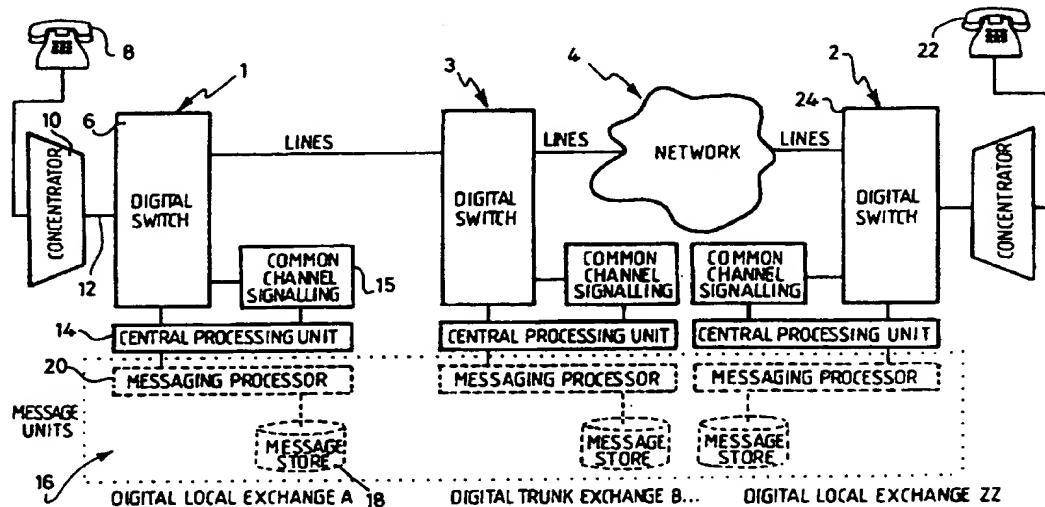


Fig. 1

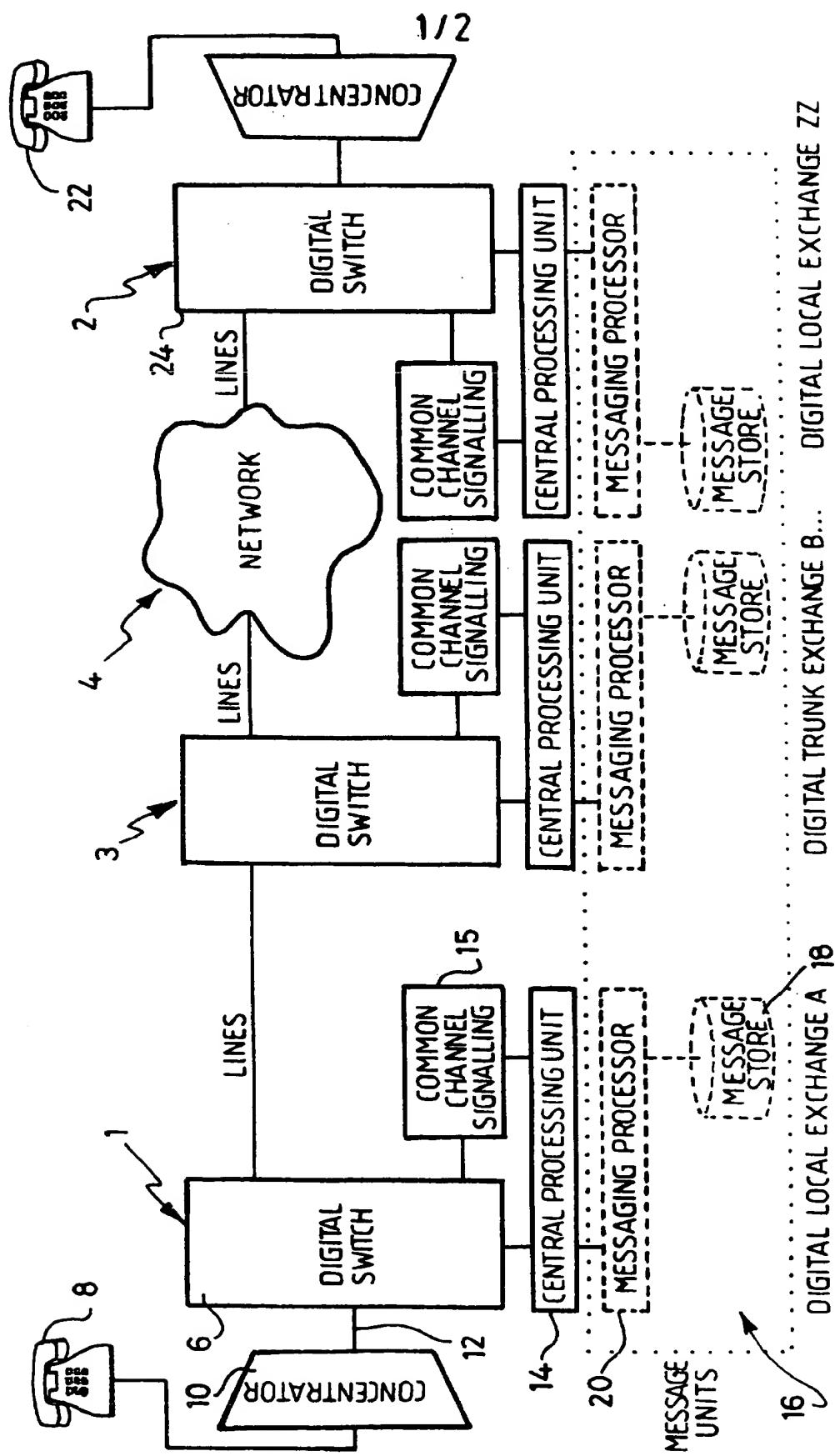
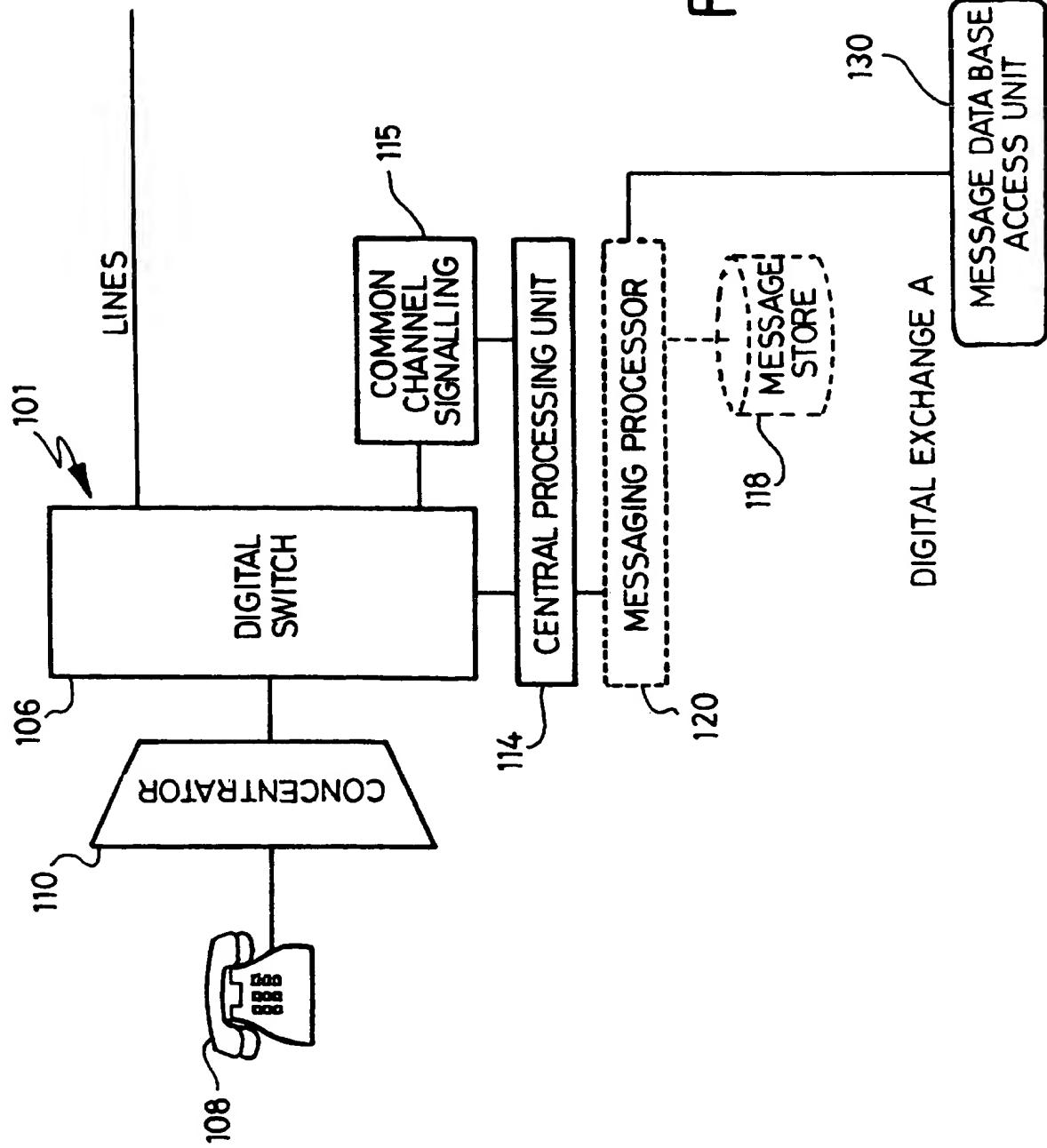


Fig. 1

Fig. 2



TITLE: TELECOMMUNICATIONS SYSTEM**Field of the Invention**

This invention relates to telecommunications systems, for example telephone systems.

Background to the Invention

A telephone system comprises various exchanges and data links which enable one telephone (or other telecommunications device such as a modem or facsimile machine) to be connected to a selected one or more other telecommunications devices connected to the system. A caller supplies information identifying the device to be called (referred to herein as the "target device") and the system then attempts to establish a connection between the caller's device and the target device to allow communications to take place.

The system also provides the caller with certain information on the status of the call. That information may take the form of an audio code such as an engaged or busy tone, an equipment busy tone or some other specialised tone such as an error tone indicating an unobtainable number. In addition, certain recorded verbal messages may be transmitted indicating that, for example lines are busy or that the number dialled has not been recognised or, more recently, is barred. Such messages have been further extended in cellular networks to convey circumstances relating to the connection attempted.

In all these cases, the information is conveyed either after the target device has been called or if no connection (at least on the basis of the identifying information supplied by the caller) is obtainable.

Summary of the Invention

According to a first aspect of the invention, there is provided a telecommunications system for conveying communications between telecommunications devices, the system comprising switching means for enabling one of said devices, a subject device, to be connected to a selected one of a plurality of other devices, a target device, in response to the receipt from the subject device of dialling information identifying the target device, said connection enabling said conveying of communications, the system further comprising storage means for storing pre-recorded message data, delay means responsive to the receipt by the switching means of said dialling data, the delay means being operable to modify the operation of the switching means so as to delay the making of the respective selected connection, and message transmission means for transmitting said message data to said subject device during said delay.

Thus, the delay means enables the system to transmit message data to a subject device whenever the device is used to initiate a connection. Consequently, the system can be used to transmit advertising messages to a subscriber each time he/she makes a call. Where the system provides connections between telephones, the advertising messages may take the form of pre-recorded audio messages. If, on the other hand, the subject telecommunication device is a facsimile machine or a computer connected to the system by a modem, the message may take the form of data for an audio or a visual signal or a combination of the two.

Preferably, the delay means further includes a hold means for placing a target device in a held state in response to the receipt of said dialling information from the subject device, to prevent the target device from being used to make another call during said delay.

The hold means accordingly enables the system to ensure that the target device is available to receive a call after the message data has been transmitted to the subject device.

Preferably, the hold means is also operable to prevent the target device from emitting any signal, to indicate that it is being called, until the end of said delay.

Consequently, if the target device is a telephone, the person being called will be

unaffected by the message, since that person will be unaware that his/her telephone is being called until after the message has been transmitted, whereupon the telephone will start ringing.

Preferably, the system includes bypass means operable, to enable a user to prevent the operation of the delay means and transmission means in relation to a selected connection, thereby allowing said connection to be made without interruption.

The bypass means thus enables the user of the subject telecommunications device to decide whether or not to receive a message. Where the subject device is a telephone, the appropriate bypass means may be activated by the user dialling a number code before dialling the number to be called. Alternatively, the bypass means may be activated if the user does not key in a special code before dialling the number of the target device. Accordingly, the user of the telephone can avoid the delay caused by the message in the event of, for example, the need to make an urgent telephone call.

Preferably, the storage means is arranged to store data for a plurality of messages.

The storage means preferably comprises a memory connected to a solid state output buffer for allowing access to message data stored thereon.

The output buffer can store a number of messages simultaneously and can generate a near instantaneous output of any of those messages. Once the output buffer has output a message, that message can be deleted on the buffer and replaced by another message from the memory.

Preferably, the message transmission means is operable to determine the identity of the subject telecommunications device and to select a predetermined one of a number of possible messages from the storage means in dependence on that identity.

Thus the transmission means can be programmed, using information on a subscriber, and demographic data to send to a subscriber only advertising messages for goods and services

which the demographic data indicates the subscriber is likely to desire.

The system may to advantage include metering means for calculating the charge for using the system, wherein the metering means is operable to apply a reduced tariff to a call made by a subscriber if the subscriber elects to receive an advertising message when making that call.

Thus a service provider can use revenue from the advertising messages to provide a financial incentive for subscriber to accept those messages.

According to a second aspect of the invention, there is provided a telecommunications system for conveying communications between telecommunications devices, the system comprising switching means for enabling one of said devices, a subject device, to be connected to a selected one of a plurality of other devices, a target device, to enable said communication to take place, storage means for storing message data, transmission means for transmitting said message data to said subject device, bypass means for preventing said transmission to any selected subject device, and metering means for calculating the charge for providing any given connection, wherein the system is operable to reduce or waive said charge if the subject device, from which the connection was initiated, is not one of said selected devices.

Preferably, the bypass means is operable in response to a signal from a subject device making a request for a connection through the system.

Brief Description of the Drawings

The invention will now be described, by way of example only, with reference to the accompanying drawings in which:-

Figure 1 is a block diagram of an embodiment of telecommunications system in accordance with the invention; and

Figure 2 is a block diagram of part of a modified version of the system.

Detailed Description

Figure 1 shows a system which includes two digital local exchanges 1 and 2 connected via a trunk exchange 3 and a network 4 which contains numerous other local and trunk exchanges (not shown). The exchanges are identical, and therefore only the local exchange 1 will be described in detail.

The exchange 1 comprises a digital switch 6 for connection to a number of telephones served by that exchange, such as the telephone 8 through a concentrator 10. The concentrator 10 acts as a multiplexer for signals from the telephones to the switch 6, and as a demultiplexer for signals travelling in the opposite direction, so that a single line 12, between the switch 6 and concentrator 10 can be used to convey signals for a multitude of telephones connected to the concentrator 10.

The digital switch 6 is connected to a central processing unit 14 which includes a delay means, hold means and bypass means (not shown), and which is connected to storage means 16.

The storage means 16 in turn, comprises a data store 18 which in turn comprises a non-solid state storage system, such as a disc drive, connected to an output buffer. The store 18 is connected to the central processing unit 14, via a messaging processor 20 which is operable to access selected message data from the output buffer and convey that data to the central processing unit 14.

The system is of the kind which employs common channel signalling in accordance with the standard No. 7 set by the International Consultative Committee for Telephony and Telegraphy (CCITT). To that end, the exchange 1 has a respective common channel signalling unit 15 which supplies to other exchanges information, other than voice signals, to control the setting up and supervision of telephone calls (and to convey signals for non-

voice services such as word processors or facsimiles).

The common channel signalling units provide fast data circuits between the processors of the exchanges which convey the information, mentioned above, with a greater efficiency than the voice circuits of the system.

Furthermore, the common channel signalling units can detect and correct errors in the information signals conveyed by the common channels, and are operable automatically to re-route signalling traffic to a back-up facility if an excessive error rate or failure of a signalling link between exchanges is detected.

In use, a subscriber wishing to call a telephone 22 from the telephone 8 lifts the handset of the latter, thereby closing a circuit which includes the telephone 8, the concentrator 10 and the line connecting them. The concentrator 10 then sends a signal to the switch 6 which identifies the telephone 8, and that information is passed on to the central processing unit 14 which instructs the switch 6 to send an initial signal to the telephone 8 causing the speaker in the latter to emit a preliminary tone. This tone is not a dialling tone, but is instead an invitation to the user of the telephone 8 to indicate whether or not he/she wishes to receive a message (such as an advertising message). In this case, that indication is provided by the user pressing a key on the keypad of the telephone to generate a special Dual Tone Multi Frequency signal. Alternatively the system may be so arranged that the user indicates willingness to accept a message by keying-in a personal identification number using the keypad of the telephone, or bypasses the message simply by dialling the identification number of the telephone 22, without first entering the personal identification number.

A dialling tone is then sent to the telephone 8 and the user can dial the number identifying the telephone 22. That number is, in this example, encoded in a sequence of Dual Tone Multi Frequency (DTMF) pulses in a known fashion.

Those tones are received by the switch 6 which conveys those signals, via the processing unit 14, to the common channel signalling unit 15. The unit 15, in turn, establishes a data link (for said control signals) with the common channel signalling unit of the exchange 3,

and supplies data identifying the telephone to be called to that unit. The trunk exchange 3 then connects the telephone 8 to a subsequent exchange in the network 4 in a similar fashion, and this process is repeated until a connection, for control signals, to the local exchange 2 is achieved.

The digital switch in the exchange 2 then provides the connection to the telephone 22, and the common channel signalling units in the exchanges connecting the telephones 8 and 22 instruct the switches of those exchanges to establish a data link for voice signals between the telephones 8 and 22. At this point, it is no longer possible for a user of the telephone 22 to make any calls since the telephone 22 is connected to the telephone 8. A similar situation pertains in conventional systems in which a called telephone cannot be used to make any other calls until the user of the calling telephone has hung up.

Accordingly, the system has at that point effectively placed the telephone 22 on hold.

If the user of the telephone 8 has elected not to receive a message, the central processing unit 14 causes the switch 6 to send a signal to the corresponding processing unit in the exchange 2, causing the latter to instruct the switch referenced 24 in the exchange 2 to produce a signal which releases the telephone 22 from the held condition and in this case, the unit 14 therefore acts as bypassing means for preventing the transmission of a message to the telephone 8.

If, however, the user has elected to receive the message, which in this example is an advertising message, the central processing unit 14 delays the sending of said signal, and during that delay instructs the message processor 20 to retrieve a message from the store 18. That message is then relayed from the processor 20 to the telephone 8, via the processing unit 14, the switch 6 and the concentrator 10. After the message has been received, the central processing unit 14 initiates ringing of the telephone 22 in the same way as it would if no message had been delivered.

During the call, the unit 14 also acts as metering means which can calculate a charge, relating to the duration of the call and the distance between the telephones 8 and 22. If

an advertising message has been sent to the telephone 8 the unit 14 calculates a lower charge than would be the case if the user of the telephone 8 had elected to receive no advertising message. Alternatively, the system can be arranged to make no charge for the call if a message has been sent to the telephone 8.

A reduced tariff is thus applied to calls made after a message has been received. The unit 14 can achieve this by, for example, applying a reduced charging rate (i.e. cost per unit time), granting a credit to the user, to be set against a charge calculated at a standard rate, or by not metering the call at all.

Figure 2 shows an exchange which has components which are the same as the corresponding components of the exchange 1 and which are therefore indicated by the reference numerals of Figure 1 raised by 100. In that exchange, the messaging processor 120 is connected to a message database access unit 130 which enables the service provider to review messages on the store 118 and to record new messages.

In both embodiments, the message store 18, 118 contains a number of different messages, any one of which can be selected by the central processing unit, depending upon which telephone connected to the exchange is to receive the message, and in accordance with a predetermined relationship. That relationship can be derived from information on the known or expected habits of the subscribers. Consequently, for example, advertising messages for computer equipment such as modems could be targeted at subscribers who are known to have purchased computers or modems in the past.

Various modifications can be made to the system without departing from the scope without departing from the scope of the present invention.

Thus, for example a further modified version of the system could be so arranged that, while the message is being delivered to the subject telephone 8, the target telephone 8 is not simply placed in a held condition, in which no outgoing calls can be made from the telephone 22. It is conceivable that the user of the target telephone 22 may "pick up" in order to make an outgoing call while a message is being delivered to the subject telephone

8, since that person will at that time be unaware that the phone 22 is being "held" through the interaction of digital switches, by someone making the call from the telephone 8.

Since it is possible that the user of the target telephone needs to make a call because of an emergency or other important matter, this version of the system is arranged to release the target telephone 22 if a call is to be made from the latter. This may be achieved by automatically overriding the "held" condition of the telephone 22, a condition typically set by the originating switch 6, if the handset of the target telephone 22 is lifted before termination of the message.

The override is initiated by a signal which is emitted from the telephone 22 when its handset is lifted, and which is relayed through the system to the processing unit 14 which can immediately cut the message to the telephone 8 and sends an apology message, indicating that the target telephone 22 has become engaged.

The system may also be so arranged that, in the unlikely event that this set of circumstances occurs just at the end of the earlier message to the caller on the telephone 8, but before the final connection to the telephone 8 has been implemented, the unit 14 again delivers an apology message, but also implements the recording of a credit to be taken into account in the calculation of charges to the user of the telephone 8.

It is possible that a service provider might wish to provide such a credit even if the initial message has only just begun transmission to the caller (on the telephone 8) or at some predetermined elapsed time from initiation, when the target lifts their handset. This can be accommodated by suitable programming of the unit 14.

A credit earned in this manner will be used the next time the user of the telephone 8 makes a call so as to prevent a message being delivered and to make a direct connection to a target telephone, that call being charged at the lower rate or not at all. Such a credit condition would be saved in the digital switch 6 at the point of entry into the network by the original caller.

The system can also be arranged to recognise the type of call the caller is making, so as to be able to detect if the caller is attempting to replace a "local" credit with (say) a follow up call which is international. If the caller attempts such a money saving device, the source switch software routine recognises that the call is different and delivers a message as usual. Only if the call is of a similar type, (for instance, the "cut-off" call was local and the next call to invoke the service also local) will the call be put straight through without charge or at a lower charging rate.

Further modifications to the system are described below.

Instead of making any connection with the target device before the message is delivered, a modified version of the system could hold the number being called in a short term buffer memory to enable the message to be transmitted before the actual dialling of the target is commenced by the switch 6.

The customary call status tones, which identify, for example, when a number is being called or when a called number is engaged, can be replaced with advertising messages in a controlled manner. This substitution could alternatively occur in a random manner.

The system may also include a means for recognising the type of telecommunications device which is making the call and select the format of the advertising message accordingly. For example, if the call is being made with a telephone, an audio message would be transmitted, whereas text or image data may be transmitted if the device is a fax machine.

Where a special tone from the subject device is normally needed in order to bypass an advertising message, the system may incorporate means for recognising an emergency or a specially programmed number such that the message is automatically withheld (and any associated delay avoided) when such a number is dialled.

The system may also include further metering means for recording the number of each advertising message transmitted for the purpose of billing the message provider(s).

In a still further modification to the system, there may be provided means for interrupting a call to introduce a further advertising message at intervals, for example ten minutes intervals, during the call. Such further messages may be received by the calling device, the call device or by both. In this arrangement, the system is preferably also set up to produce a warning signal, such as a sound or sounds to indicate that a further message is about to be transmitted.

Claims

1. A telecommunications system for conveying communications between telecommunications devices, the system comprising switching means for enabling one of said devices, a subject device, to be connected to a selected one of a plurality of other devices, a target device, in response to the receipt from the subject device of dialling information identifying the target device, said connection enabling said conveying of said communications, the system further comprising storage means for storing pre-recorded message data, delay means operable to modify the operation of the switching means so as to delay the making of the respective selected connection, and message transmission means for transmitting said message data to said subject device during said delay.
2. A system according to claim 1, in which the delay means further includes a hold means for placing a target device in a held state in response to the receipt of said dialling information from the subject device, to prevent the target device from being used to make another call during said delay.
3. A system according to claim 1 or claim 2, in which the delay means is operable to prevent the target device from emitting any signal, to indicate that it is being called, until the end of said delay.
4. A system according to any of the preceding claims, in which the system includes bypass means selectively operable to prevent the operation of the delay means and transmission means in relation to a selected connection, thereby allowing said connection to be made without interruption by the message.
5. A system according to any of the preceding claims, in which the storage means stores data constituting a plurality of messages.
6. A system according to any of the preceding claims, in which the storage means comprises a memory connected to a solid state output buffer for allowing instantaneous or near instantaneous access to message data stored thereon.

7. A system according to any of the preceding claims, in which the message transmission means is operable to determine the identity of the subject telecommunications device and to select a predetermined one of a number of possible messages from the storage means in dependence on the identity of that device.
8. A system according to any of the preceding claims, in which the system includes metering means for calculating the charge for using the system, wherein the metering means is operable to apply a reduced tariff to a call made by a subscriber if the subscriber elects to receive an advertising message when making that call, so that a lower, or no, charge is made for that call.
9. A telecommunications system for providing a connection between a selected two or more telecommunications devices to enable communications to be conveyed between the devices, the system comprising storage means for storing message data, transmission means for transmitting data to at least one of said selected two or more devices, bypass means operable selectively to prevent the transmission of a message for a given connection, and metering means for calculating a charge for providing any given connection, wherein the system is so arranged as to apply a reduced tariff to a connection in respect of which said message has been transmitted, thereby to reduce or waive any charge for the connection.
10. A system according to claim 9, in which the bypass means is operable in response to a signal selectively generated by a device which is initiating a connection through the system, a user of the device thereby being able to decide whether or not the reduced tariff is to apply.
11. A system according to any of the preceding claims, in which the system is operable to cancel an attempt to establish a connection if an outgoing call is made from the target device which a message is being transmitted to the subject device.



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Claims searched: 1-8

Examiner: Al Strayton
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Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): H4K; KF42; KF424; KF50B

Int Cl (Ed.6): H04M

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2 206 265 A (ATT) See the abstract	1-8
X	EP 0 713 317 A1 (BORBON BLEND) See the abstract	-
X	WO 91/06187 A1 (DUFOUR) See the abstract	-
X	US 5 333 186 (GUPTA) See the abstract	-

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.